Growth and mortality of corals on long-term monitoring sites in St. John, USVI.

Website: https://www.bco-dmo.org/dataset/735097

Data Type: Other Field Results

Version: 1

Version Date: 2018-05-17

Project

» LTREB Long-term coral reef community dynamics in St. John, USVI: 1987-2019 (St. John LTREB)

» RUI-LTREB Renewal: Three decades of coral reef community dynamics in St. John, USVI: 2014-2019 (RUI-LTREB)

Contributors	Affiliation	Role
Edmunds, Peter J.	California State University Northridge (CSU-Northridge)	Principal Investigator
Ake, Hannah	Woods Hole Oceanographic Institution (WHOI BCO-DMO)	BCO-DMO Data Manager

Abstract

Growth and mortality of corals on long-term monitoring sites in St. John, USVI.

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Coverage

Spatial Extent: **Lat**:18.32 **Lon**:-64.723

Temporal Extent: 1996 - 2016

Dataset Description

Data published in Ecology paper entitled “Intraspecific variation in growth rate is a poor predictor of fitness for reef corals”.

Acquisition Description

Methods in paper (Edmunds 2017).

Processing Description

BCO-DMO Processing Notes:

- filled in blank cells with nd
- sorted by species
- added column names tag_number and coral_taxon
- replaced - with _ in column names

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Related Publications

Edmunds, P. J. (2017). Intraspecific variation in growth rate is a poor predictor of fitness for reef corals. Ecology, 98(8), 2191–2200. doi:10.1002/ecy.1912

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Parameters

Parameter	Description	Units
tag_number	Coral tag number	unitless
coral_taxon	Coral taxon	unitless
years_1996_1997	Pair of years over which growth or death were recorded	millimeter per year
years_1997_1998	Pair of years over which growth or death were recorded	millimeter per year
years_1998_1999	Pair of years over which growth or death were recorded	millimeter per year
years_1999_2000	Pair of years over which growth or death were recorded	millimeter per year
years_2000_2001	Pair of years over which growth or death were recorded	millimeter per year
years_2001_2002	Pair of years over which growth or death were recorded	millimeter per year
years_2002_2003	Pair of years over which growth or death were recorded	millimeter per year
years_2003_2003	Pair of years over which growth or death were recorded	millimeter per year
years_2004_2005	Pair of years over which growth or death were recorded	millimeter per year
years_2005_2006	Pair of years over which growth or death were recorded	millimeter per year
years_2006_2007	Pair of years over which growth or death were recorded	millimeter per year
years_2007_2008	Pair of years over which growth or death were recorded	millimeter per year
years_2008_2009	Pair of years over which growth or death were recorded	millimeter per year

years_2009_2010	Pair of years over which growth or death were recorded	millimeter per year
years_2010_2011	Pair of years over which growth or death were recorded	millimeter per year
years_2011_2012	Pair of years over which growth or death were recorded	millimeter per year
years_2012_2013	Pair of years over which growth or death were recorded	millimeter per year
years_2013_2014	Pair of years over which growth or death were recorded	millimeter per year
years_2014_2015	Pair of years over which growth or death were recorded	millimeter per year

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Deployments

Edmunds_VINP

Website	https://www.bco-dmo.org/deployment/523357
Platform	Virgin Islands National Park
Start Date	1987-01-01
End Date	2016-09-01
Description	Studies of corals and hermit crabs

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Project Information

LTREB Long-term coral reef community dynamics in St. John, USVI: 1987-2019 (St. John LTREB)

Website: http://coralreefs.csun.edu/

Coverage: St. John, U.S. Virgin Islands; California State University Northridge

Long Term Research in Environmental Biology (LTREB) in US Virgin Islands: From the NSF award abstract: In an era of growing human pressures on natural resources, there is a critical need to understand how major ecosystems will respond, the extent to which resource management can lessen the implications of these responses, and the likely state of these ecosystems in the future. Time-series analyses of community structure provide a vital tool in meeting these needs and promise a profound understanding of community change. This study focuses on coral reef ecosystems; an existing time-series analysis of the coral community structure on the reefs of St. John, US Virgin Islands, will be expanded to 27 years of continuous data in annual increments. Expansion of the core time-series data will be used to address five questions: (1) To what extent is the ecology at a small spatial scale (1-2 km) representative of regional scale events (10's of km)? (2) What are the effects of declining coral cover in modifying the genetic population structure of the coral host and its algal symbionts? (3) What are the roles of pre- versus post-settlement events in determining the population dynamics of small corals? (4) What role do physical forcing agents (other than temperature) play in driving the population dynamics of juvenile corals? and (5) How are populations of other, non-coral invertebrates responding to decadal-scale declines in coral cover? Ecological methods identical to those used over the last two decades will be supplemented by molecular genetic tools to understand the extent to which declining coral cover is affecting the genetic diversity of the corals remaining. An information management program will be implemented to create broad access by the scientific community to the entire data set. The importance of this study lies in the extreme longevity of the data describing coral reefs in a unique ecological context, and the immense potential that these data possess for understanding both the patterns of comprehensive community change (i.e., involving corals, other invertebrates, and genetic diversity), and the processes driving them. Importantly, as this project is closely integrated with resource management within the VI National Park, as well as larger efforts to study coral reefs in the US through the NSF Moorea Coral Reef LTER, it has a strong potential to have scientific and management implications that extend further than the location of the study. The following publications and data resulted from this project: 2015 Edmunds PJ, Tsounis G, Lasker HR (2015) Differential distribution of octocorals and scleractinians around St. John and St. Thomas, US Virgin Islands. Hydrobiologia. doi: 10.1007/s10750-015-2555-zoctocoral - sp. abundance and distributionDownload complete data for this publication (Excel file) 2015 Lenz EA, Bramanti L, Lasker HR, Edmunds PJ. Long-term variation of octocoral populations in St. John, US Virgin Islands. Coral Reefs DOI 10.1007/s00338-015-1315-xoctocoral survey - densitiesoctocoral counts - photoquadrats vs. insitu surveyoctocoral literature reviewDownload complete data for this publication (Excel file) 2015 Privitera-Johnson, K., et al., Density-associated recruitment in octocoral communities in St. John, US

Virgin Islands, J.Exp. Mar. Biol. Ecol. DOI 10.1016/j.jembe.2015.08.006octocoral recruitmentDownload complete data for this publication (Excel file) 2014 Edmunds PJ. Landscape-scale variation in coral reef community structure in the United States Virgin Islands. Marine Ecology Progress Series 509: 137–152. DOI 10.3354/meps10891. Data at MCR-VINP. Download complete data for this publication (Excel file) 2014 Edmunds PJ, Nozawa Y, Villanueva RD. Refuges modulate coral recruitment in the Caribbean and Pacific. Journal of Experimental Marine Biology and Ecology 454: 78-84. DOI: 10.1016/j.jembe.2014.02.00 Data at MCR-VINP.Download complete data for this publication (Excel file) 2014 Edmunds PJ, Gray SC. The effects of storms, heavy rain, and sedimentation on the shallow coral reefs of St. John, US Virgin Islands. Hydrobiologia 734(1):143-148. Data at MCR-VINP.Download complete data for this publication (Excel file) 2014 Levitan, D, Edmunds PJ, Levitan K. What makes a species common? No evidence of density-dependent recruitment or mortality of the sea urchin Diadema antillarum after the 1983-1984 mass mortality. Oecologia. DOI 10.1007/s00442-013-2871-9. Data at MCR-VINP.Download complete data for this publication (Excel file) 2014 Lenz EA, Brown D, Didden C, Arnold A, Edmunds PJ. The distribution of hermit crabs and their gastropod shells on shallow reefs in St. John, US Virgin Islands. Bulletin of Marine Science 90(2):681-692. http://dx.doi.org/10.5343/bms.2013.1049 Data at MCR-VINP.Download complete data for this publication (Excel file) 2013 Edmunds PJ. Decadal-scale changes in the community structure of coral reefs in St. John, US Virgin Islands. Marine Ecology Progress Series 489: 107-123. Data at MCR-VINP.Download complete data for this publication (zipped Excel files) 2013 Brown D, Edmunds PJ. Long-term changes in the population dynamics of the Caribbean hydrocoral Millepora spp. J. Exp Mar Biol Ecol 441: 62-70. doi: 10.1016/j.jembe.2013.01.013Millepora colony sizeMillepora cover - temps - storms 1992-2008Millepora cover 1992-2008seawater temperature USVI 1992-2008storms USVI 1992-2008Download complete data for this publication (Excel file) 2012 Brown D, Edmunds PJ. The hermit crab Calcinus tibicen lives commensally on Millepora spp. in St. John, United States Virgin Islands. Coral Reefs 32: 127-135. doi: 10.1007/s00338-012-0948-2crab abundance and coral sizecrab displacement behaviorcrab nocturnal surveyscrab predator avoidanceDownload complete data for this publication (Excel file) 2011 Green DH, Edmunds PJ. Spatio-temporal variability of coral recruitment on shallow reefs in St. John, US Virgin Islands. Journal of Experimenal Marine Biology and Ecology 397: 220-229. Data at MCR-VINP.Download complete data for this publication (Excel file) 2011 Colvard NB, Edmunds PJ. (2011) Decadal-scale changes in invertebrate abundances on a Caribbean coral reef. Journal of Experimental Marine Biology and Ecology. 397(2): 153-160. doi: 10.1016/j.jembe.2010.11.015benthic invert codesinverts - Tektite and Yawzi Ptinverts - pooledDownload complete data for this publication (Excel file)

RUI-LTREB Renewal: Three decades of coral reef community dynamics in St. John, USVI: 2014-2019 (RUI-LTREB)

Website: http://coralreefs.csun.edu/

Coverage: USVI

Describing how ecosystems like coral reefs are changing is at the forefront of efforts to evaluate the biological consequences of global climate change and ocean acidification. Coral reefs have become the poster child of these efforts. Amid concern that they could become ecologically extinct within a century, describing what has been lost, what is left, and what is at risk, is of paramount importance. This project exploits an unrivalled legacy of information beginning in 1987 to evaluate the form in which reefs will persist, and the extent to which they will be able to resist further onslaughts of environmental challenges. This long-term project continues a 27-year study of Caribbean coral reefs. The diverse data collected will allow the investigators to determine the roles of local and global disturbances in reef degradation. The data will also reveal the structure and function of reefs in a future with more human disturbances, when corals may no longer dominate tropical reefs. The broad societal impacts of this project include advancing understanding of an ecosystem that has long been held emblematic of the beauty, diversity, and delicacy of the biological world. Proposed research will expose new generations of undergraduate and graduate students to natural history and the quantitative assessment of the ways in which our planet is changing. This training will lead to a more profound understanding of contemporary ecology at the same time that it promotes excellence in STEM careers and supports technology infrastructure in the United States. Partnerships will be established between universities and high schools to bring university faculty and students in contact with k-12 educators and their students, allow teachers to carry out research in inspiring coral reef locations, and motivate children to pursue STEM careers. Open access to decades of legacy data will stimulate further research and teaching.

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Funding

Funding Source	Award
National Science Foundation (NSF)	DEB-0841441
NSF Division of Environmental Biology (NSF DEB)	DEB-1350146

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